Mission of Architectural & Manufacturing Sciences Institute:
AMSI provides faculty and students with the opportunity to partner with business, industry and the community. These efforts support the economic development of our region through applications of our faculty’s expertise while providing students with practical experiences in their chosen career path. We customize services to specifically meet the architectural and manufacturing needs of our clientele.

Distinctiveness and Impact:
AMSI enhances our student’s educational experience by extending the lessons of the classroom through the development of ‘real-world’ projects … thus further preparing them for their future careers.
AMSI organizes and provides workshops, seminars and conferences for architectural and manufacturing processes and applications.

ARCHITECTURAL Emphasis:
The Architectural Sciences component of the AMS Institute offers professional design services, construction documentation production, and computer-generated renderings and animations. All student work is performed under the direct supervision of a licensed architect.

MANUFACTURING Emphasis:
The Manufacturing section of the AMS Institute gives students the experience of working in the field using some of the latest technology available.

Current Points of Pride:
• 11 students employed developing 20 design projects on the drawing board.
• 6 Design Projects under construction.
• AMSI surpassed the $13 million plateau in construction value for Built Works to date.
• AMSI currently fabricating 40 Bike Racks for WKU -- + 325 units to date.
• AMSI Alumni attending Graduate School for Master of Architecture degree:
  Nathan Diestelkamp: University of Illinois @ Chicago
  Tyler LeMarinel - University of Colorado @ Denver
  Lee Ross Dinwiddie - Savannah College of Art & Design
  Brendan Corcoran - University of Kentucky
  Matt Nett - University of Kentucky
  Eric Lahm - University of Kentucky
  Chris Harris - University of Kentucky
  Brad Benz - Pratt University / Brooklyn, NY

Recent graduates with Master of Architecture degree
Eric Hathaway—Savannah College of Art & Design
Todd Lehmenkuler - Taliesin / Frank Lloyd Wright School
LaDonna P. Justice - Andrews University / Detroit

Figure 1: Olde Stone Residence 2005.36 - Architect: Neal Downing, AIA
Student Workers: Tyler LeMarinel, Brendan Corcoran, Lee Ross Dinwiddie, Nate Diestelkamp, L. Lee and S. Miller
Figure 2: Back View of Olde Stone Residence

Figure 3: Elson Residence 2007.04 - Architect: Neal Downing, AIA
Student Workers: Brendan Corcoran and Lee Ross Dinwiddie

Figure 4: Alpha Delta Pi Sorority House 2007.34 - Architect: Neal Downing, AIA
Student Workers: Lee Ross Dinwiddie
The summer of 2009 marked an exciting time for the Center for Biodiversity Studies (CBS) with the successful addition of 285 acres of high quality landscape to the Upper Green River Biological Preserve (UGRBP). The UGRBP has been a well-funded initiative through the Kentucky Heritage Land Conservation Fund (KHLCF). Based on the original proposal submitted in November 2000 by Dr. Albert Meier, Dr. Ouida Meier and Dr. Scott Grubbs, by July 2002 we successfully raised nearly $1.2 million to purchase 671 acres positioned both north and south of the Green River in Hart County, Kentucky. A celebration was held in April 2003 on-site to officially dedicate the UGRBP as an entity of Western Kentucky University. Almost immediately we began to engage in several management initiatives aimed at restoring vegetation to a natural state, namely bottomland forest, upland grass, rocky limestone glade habitats. The UGRBP is home to over 600 plant species and seven federally-listed threatened and endangered species of animals, including the Gray Bat, Indiana Bat, and five species of mussels in the Green River. The greater UGRBP-Mammoth Cave region is also home to over 200 bird species.

In May 2003 we also signed a Memorandum of Agreement with Mammoth Cave National Park to establish a mussel rearing facility on-site for the purpose of rearing and establishing self-sustaining population of globally-rare Green River mussel species back into their native habitats. The most successful use of UGRBP, however, has been for Biology coursework where field-based laboratory work requires having a high-quality field environment to enhance the student experiences and success. Honors -- Animal Biology and Diversity (224H), Ecology (BIOL 315), Insect Biodiversity (BIOL 325), Ornithology (BIOL 326), Plant Taxonomy (BIOL 348), Mammalogy (BIOL 459), Aquatic Insect Diversity (BIOL 475), and Aquatic Field Ecology (BIOL 497) each make extensive use of the diverse habitats available at UGRBP. The Departments of Geology and Geography and Folk Studies have also made use of UGRBP for coursework and research.

In 2006, WKU entered into a cooperative agreement with the Wild River Programs of the Kentucky Division of Water (KDOW) to manage an additional 127 acres (Goebel Tract) located a mere 500 ft. west of UGRBP. Although the property is owned by KDOW we have management responsibilities that are completely congruous with those at UGRBP. In addition, there is an existing house on the Goebel Tract that prioritized usage and thanks to funding provided for Housing Improvement Request we have updated the plumbing, electrical, and heating/cooling capacity of the house to accommodate small classes for overnight and short-term (e.g., 1 or 2 weeks) field-based courses. The recent addition of the 285 acres, which is now owned by WKU, and a second recently-approved acquisition of an additional 90 acres by the Wild River Program, which means that UGRBP now has direct managerial oversight of education and conservation-based initiatives on 1170 acres total. Overall, we have been extremely pleased by the generosity and cooperative efforts maintained between the KHLCF and WKU.

**Figure 1:** Black-eyed Susan's and Purple Coneflower.
**Figure 2:** Ecology students at the deep ravine stream on the UGRBP north side.
**Figure 3:** McCoy Bluehole during spring.
**Figure 4:** Fire management of uplands limestone glade habitat.
- Applied Research In The News -

**Agriculture Research and Education Complex**

**Director:** Linda Gonzales  
TCNW 237, 270-745-3151  
lin.onda.gonzales@wku.edu

- Six graduate students received at least partial support for their assistantships.
- Tours of AREC were hosted for prospective students and their parents.
- Graduate and undergraduate students, in the company of Martin Stone, attended the Kentucky Nutrition and Education Association meeting in Springfield, Kentucky.
- Graduate and undergraduate students in the company of Dr. Becky Gillfillen, attended the UK Princeton Field Day.
- Students are working under the guidance of David Newsom in cooperation with the Bowling Green USDA Agricultural Research Service and Organic Alchemy, LLC to develop a methane digester.

**Biotechnology Center**

**Director:** Nancy Rice  
TCNW 201, 270-745-5995  
nancy.rice@wku.edu

- The NIH has awarded $15 million to the Kentucky IDEA Network of Biomedical Research Excellence (Ky-INBRE) of which Western Kentucky University is a part.
- Support from the Ky INBRE program has been pivotal in impacting biomedical research infrastructure, capacity, and productivity at WKU.
- In the past 8 years, 75 undergraduate and graduate students have participated in research activities with Ky INBRE funded / Biotechnology Center faculty.
- From these students, 36 entered masters or Ph.D. graduate programs, 37 entered health-related professional schools, and 12 are employed as research technicians in biotechnology research laboratories.
- In the first year of the new INBRE renewal, WKU investigators will receive over $450,000 in direct costs from the Ky INBRE program.
- Funds will provide support to Dr. Claire Rinehart for WKU’s growing involvement in the Kentucky/Tennessee Bioinformatics Summit.

**Applied Physics Institute**

**Director:** Alex Barzilov  
TCCW 214, 270-745-5484  
alexander.barzilov@wku.edu

- API awarded $145,000 KSEF grant to develop the broadcast technology for elimination of random anomalous peak loads (Dr. Phil Wombie).
- API’s X-Ray Diffractometer was fully automated using Lab View with online data analysis option (Dr. Doug Harper).
- Dr. Vladimir Dobrokhотов, Assistant Professor of Physics, joined API. His research interests are in the area of applied nanoscience.
- Student Landon Oakes received an Outstanding Poster award for his presentation on detection of explosives using functionalized nanospringecmats at the 2nd Int. Nanotechnology Symp. (Sullivan University).
- Student Mayme Van Meeveren awarded scholarship to participate in 2009 Conf. for Undergraduate Women in Physics (University of Nebraska).

**Bioinformatics & Information Science Center**

**Director:** Claire Rinehart  
TCNW 121, 270-745-5997  
claire.rinehart@wku.edu

- A $2.379 million appropriation from the US Department of Education will cover 98% of the cost to upgrade the High Performance Computing Center in Ogden College. The new system will be overseen by BISC and will greatly benefit the entire college.
- The HPCC will support the delivery of modeling, simulation and visualization tools that require high end computing resources. This will directly enhance research and curriculum experiences that foster understanding of complex systems in the STEM disciplines. The HPCC will also enhance regional economic development by attracting high tech research and industries to the area.

**Architectural and Manufacturing Science Institute**

**Director:** Neal Downing  
EST 222, 270-745-6302  
neal.downing@wku.edu

- 11 students employed developing 20 design projects on the drawing board.
- 6 Design Projects under construction.
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- 8 AMSI Alumni attending Graduate School for Master of Architecture degree: Nathan Diestelkamp, Tyler LeMarinel, Lee Ross Dinwiddle, Brendan Corcoran, Matt Nett, Eric Lahm, Chris Harris and Brad Benz.
- 3 recent graduates of Master of Architecture degree: Eric Hathaway, Tod Lehmenkuler and Ladonna P. Justice.

**Center for Water Resource Studies**

**Director:** Andrew Ernest  
TCCW 105, 270-745-8895  
andrew.ernest@wku.edu

- Awarded a 2-year project from the National Institute for Home­ town Security to develop best practice protocols for response and recovery operations in contaminated water systems.
- Working collaboratively with Bowling Green Community College to offer on-line Water Training Institute.
- Rick Fowler presented USDA-ARS research at the 15th International Congress of Speleology in Kerrville, TX.
- Christal Wade delivered presentations on ‘Potential Waterborne Pathogens’ to Water Treatment Plant Operators throughout the State.
- Christal Wade delivered a presentation on ‘Aging Water Workforce’ at the TN Association of Utility Districts’ Annual Convention in Gatlinburg, TN.
- Andrew Ernest delivered a presentation on the Water Training Institute at the KY/TN Water Professionals Conference in Lexington, KY.
• **ARTP Office**  
  Ogden College of Science and Engineering  
  TCCW 100  
  1906 College Heights Blvd.  
  Bowling Green, KY 42101  
  270–745–8892  
  270–745–8893 Fax

• **Blaine Ferrell**  
  Director, Dean OCSE  
  TCCW 105  
  270–745–4448  
  blaine.ferrell@wku.edu

• **Shavonna Smith**  
  Research Coordinator  
  TCCW 100C  
  270–745–2761  
  shavonna.smith@wku.edu

• **Wanda Johnson**  
  Operations Specialist  
  TCCW 100B  
  270–745–8894  
  wanda.johnson@wku.edu

• **Lisa Haynes**  
  Office Coordinator  
  EST 438  
  270–745–3252  
  lisa.haynes@wku.edu

• **Sharon McGowan**  
  Office Associate  
  TCCW 100B  
  270–745–8892  
  sharon.mcgowan@wku.edu

Website:  
http://www.wku.edu/artp

Feedback:  
lisa.haynes@wku.edu

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**Engineering Services Center**  
Director:  
Kevin Schmaltz  
EBS 2210, 270-745-8859  
kevin.schmaltz2@wku.edu

- Four EE students and Ron Rizzo assisted a WKU student with modifications to his wheelchair to install a removable desk surface that included access to local power for a laptop.
- Mechanical Engineering faculty, students and support staff are working on the final stages of a biomass heating project for a greenhouse at the WKU Farm, and are also completing the final safety compliance checks for the biodiesel facility also located at the WKU Farm.
- Joel Lenoir is completing a project involving laser scanning and reverse engineering of components using point cloud analysis; this service will be made available to the University community soon.
- EE senior students are beginning projects involving partners including Health Co., F.W. Beck, WRECC, Logan Aluminum, and Xhale, as well as a project to convert a Toyota Prius from a traditional hybrid to a plug-in hybrid.

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**Hoffman Environmental Research Institute**  
Director:  
Chris Groves  
EST 401, 270-745-5201  
chris.groves@wku.edu

- The Institute’s China Environmental Health Project, in collaboration with the foundation A Child’s Right and the US Agency for International Development, completed installation of water treatment systems supplying pure water to over 27,000 orphans and elderly residents of China’s Social Welfare Institutes.
- The Institute welcomed visiting scholar Dr. Vu Thi Minh Nguyen of Vietnam’s Institute of Geosciences and Mineral Resources who will work at WKU for one year.
- The Institute conducted a workshop on karst hydrogeology for more than 100 Chinese government hydrologists and students in Kunming, China.
- Institute students and staff continued water quality research and resource inventories at the Crumps Cave Educational Preserve in Nicholas Warren County, KY.
- Institute staff participated in the UNESCO-sponsored conference “Sustainability of the Karst Environment” in Croatia.

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**Institute for Combustion Science and Environmental Technology**  
Director:  
Wei-Ping Pan  
2413 Nashville Rd.,  
270-745-2272  
wei-ping.pan@wku.edu

- Award received from Kentucky Department for Energy Development and Independence to study “Cost-Effective and Practical Coal-based Chemical Looping Combustion Process for Step-in Reducing Carbon Dioxide Using Kentucky Coals and Oil Residues.” The goal of this project is to research and development of a novel combustion process that directly produces high concentration of CO2 in its flue gases, without using solvents in post combustion.
- Anhui University of Science and Technology sampling team is the first team in China to use the US EPA Method 30B for flue gas mercury measurement. Mr. Cheng-Li Wu (a former visiting scholar at ICSET/WKU) was trained to use this sorbent trap method during his stay, he later led this test team to collect mercury samples from four coal-fired power plants. This project is supported by USaid.

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**Kentucky Climate Center**  
Director:  
Stuart Foster  
EST 304, 270-745-5983  
stuart.foster@wku.edu

- The Kentucky Mesonet added six new remote weather and climate monitoring stations, which brings the total number of operational stations to 35. The latest additions to the statewide network include sites in the following counties: Clark, Hardin, Johnson, Marshall, Mason, and Morgan. Data from all Kentucky Mesonet stations can be accessed at www.kymesonet.org.
- Students employed by the Kentucky Mesonet provided valuable contributions to the project by applying their skills in site surveying, meteorology technology, quality assurance of meteorological data, and development of website enhancements.
- Two graduate students successfully defended their thesis research. Ronnie Leeper completed a simulation of meso-scale atmospheric impacts of land use/land cover change on climate. Mr. Leeper is now employed as a research scientist with the Kentucky Climate Center. Crystal Bergman completed an analysis of the 2007 drought in Kentucky and an assessment of drought policy and planning in Kentucky. Ms. Bergman has begun doctoral studies at the University of Nebraska-Lincoln, with affiliation in the National Drought Mitigation Center.

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**Advanced Materials Institute**  
Director:  
Darwin Dahl  
TCNW 300/301, 270-780-2568  
darwin.dahl@wku.edu

- A grant proposal is being prepared whereby AMI is seeking a mercury analyzer and a simultaneous ICP to expand its elemental analysis capabilities.
- External contracts for materials analysis has brought in an excess of $4000 since the start of the fiscal year.
- AMI received top-rated results with their round-robin testing for quality control as revealed in the CANSPEX 2009-3 performance report. Testing involved XRF, TGA, bomb calorimetry, ion chromatography and sulfur analysis.